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Nucleotide sequence of a full length cDNA clone encoding a polyubiquitin gene from *Pisum sativum*

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We have isolated two cDNA clones, PCU1 and PCU2, from a pea leaf cDNA library using a nucleotide probe from an *S. pombe* ubiquitin gene (Powell and Watts, unpublished data). The two clones encode different polyubiquitin genes, with 80% homology at the nucleotide level, and 79% and 76% homology respectively with the *S. pombe* gene probe. The sequence of a full-length clone, PCU1, is shown below. The inferred polypeptide contains five tandem copies of ubiquitin, with an additional Phe at the C terminus. Comparison with other plant polyubiquitin genes indicates that there is total conservation at the protein level, with the highest homology at the DNA level (82%) with Soybean polyubiquitin (19).

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      M Q I F V K T L T G K T I T L E V E S S D T I D
6AAATTCGATAATATAAGATGCAAAATTTTCGTTAAGACCCTCACCGGCAAGACCATCAGCTCTGAAGTTGAGAGTTTCAGATACCATAGA 90

      M V E A K I Q D E E G I F P F D Q Q R L I F A G K Q L E D G R
CAATGTTAAAGGCCAAGATTCAAGACAAAGGAGGATCCCTCTGACCAAGCAGCCTCTCATTTTGTCTGGCAAGCAACTCGAGGATGGGCG 180

      T L A D Y N I Q K E S T L M L V L R L R G G M Q I F V K T L
TACTCTTGTCTGATTACAAATACAGAAAGGAGTCCACCCCTCCATCTGTGTGTGCGACTTCGTGGTGGGATGCAAAATCTTTGTGAAAGACTCT 270

      T G K T I F L E V E S S D T I D M V E A K I Q D E E G I F P
CACTGGAAAGACCATCACCCCTTGAGGTGGAGAGCTCTGATACCATTTGACAAATGTCAGAGCCAAAGATCCAGGACAAAGAGGGCATTCCCCC 360

      D Q Q R L I F A G K Q L E D G R T L A D Y N I Q K E S T L M
AGACCAACAAAGGCTCATCTTTGTCTGGCAACAGCTCGAAGATGGCAGAACTTTGGCCGATTACCAACATCCAGAAAGAAATCCACCTTCCA 450

      L V L R L R G G M Q I F V K T L T G K T I T L E V E S S D T
TCTTGTGTGCGACTCTGTGGTGGATATGAGATTTTGTGAAAGACCCTTACCGGCAAGACAAATTACTTTGGAGGTGAGAGCTGTGACAC 540

      I D E V E A K I Q D E E G I F P F D Q Q R L I F A G K Q L E D
AATGTACAAATGTGAAGGCCAAGATACAGGACAAAGAGGATTCTCTCCAGACCAAGCAAGGTTGATTTTGTCTGGAAAGCAGCTCGAAGG 630

      G R T L A D Y N I Q K E S T L M L V L R L R G G M Q I F V K
TGCCGGAATCTTGGCCGACTACAACATTCAGAAAGAAATCAACCTCCATCTGTGTTTGAAGACTTCGTGGTGGTATGAGATTTTGTGAA 720

      T L T G K T I T L E V E S S D T I D M V E A K I Q D E E G I
AACCCTCACCGGCAAGACAAATTACTTTGGAGGTAGAGAGCTCAGACACAAATGACAAATGTGAAGGCCAAGATACAGGACAAAGAGGGTAT 810

      P F D Q Q R L I F A G K Q L E D G R T L A D Y N I Q K E S T
CCCTCCAGACCAAGCAAGGTTGATTTTGTCTGGAAAGCAGCTTGAAAGATGGCCGAACCTTTGGCTGATTACAACATTCAGAAAGGAGTCCAC 900

      L M L V L R L R G G M Q I F V K T L T G K T I T L E V E S S
CCCTTACCTTGTCTGTGAGGGGAGGTATGAGATCTTTGTGAAGACTTTGACAGGAAAGACTATTACCTTAGAGGTAGAAAGTTTC 990

      D T I D M V E A K I Q D E E G I F P F D Q Q R L I F A G K Q L
AGACACAATCGAATATGTGAAGGCCAAATAACAGGACAAAGAGGGAATCCACCATGATCAGCAGAGGTTGATCTTTGTCTGGGAGCAATT 1080

      E D G R T L A D Y N I Q K E S T L M L V L R L R G G F
GGAGGATGGAAGGACTCTGTCTGACTACAACATTCAGAAAGAGTCTACTCTTACCTTGTGTCGTCTGCTGGTGGATTTTAAAGAAAT 1170

      GTATTGGGACCGAAACCGTAAACCGTTTATAGTCTTTGGCTTTTATGTTTCAGAACTTGATATAATGGATCC 1241

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